Sumo Pump

Modular electric pump

User and Maintenance Manual

Original text translation

Guarantee

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Manufacturer	**DropsA SpA**
Product	**SUMO Pump**
Year	**2008**
Certification	CE

Manual compiled in accordance with Directive CE 98/37 Appendix I, paragraph 1.7.4

C2116IE ï WK 50/09

http://www.dropsa.com

1. INTRODUCTION

This user and maintenance manual relates to the **Sumo pump**. Using this pump means that oils and greases can be distributed within lubrication systems even at high pressures of up to 400 bar (5880 psi).
The latest version may be obtained from the Technical-Commercial Office, or by consulting our web site http://www.dropsa.com**.**

The pump subject of this manual must be used by qualified personnel with basic hydraulic and electrical knowledge.
This user and maintenance manual contains important information about protecting the health and safety of the personnel who intend to use this apparatus. You must read and look after it carefully, making sure that it is available at all times for the operators who intend to consult it.

2. GENERAL DESCRIPTION

The Sumo series of lubrication pumps may be adapted to many uses without making any mechanical changes even after it has been installed. In fact, by making a selection from a set of components which are fully compatible and easy to assemble, the pressure, quantity of lubricant delivered, actual type of lubricant or type of distribution can be altered.
This construction technique is essentially based on the following modules:

- Electric motor
- Pump body with integrated reducer
- Two pumping elements
- Reservoir
- Valves and outlet unit (inverter, pressure adjustment valve, etc.).

There is only one bearing structure for all versions, with the dual pumping element constituting the essential module.
The pump unit possesses one single output, because the deliveries from the two pumping elements flow into a manifold unit.
Two types of tank for grease and two for oil with different volumes (of 30 or 100 kg) with stirring paddle and level indicators can be arranged on the pump body.
The pump is controlled by normal electrical apparatus which is able to effect inversion and perform the programmed cycles.
The Sumo electric pump is fully protected against the external environment and can operate without difficulty under the most severe environmental conditions.

Photo 1

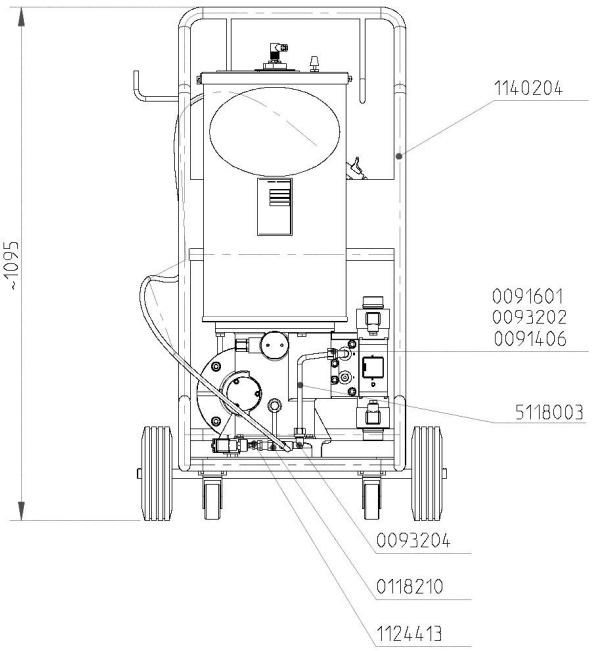
Sumo 100 kg

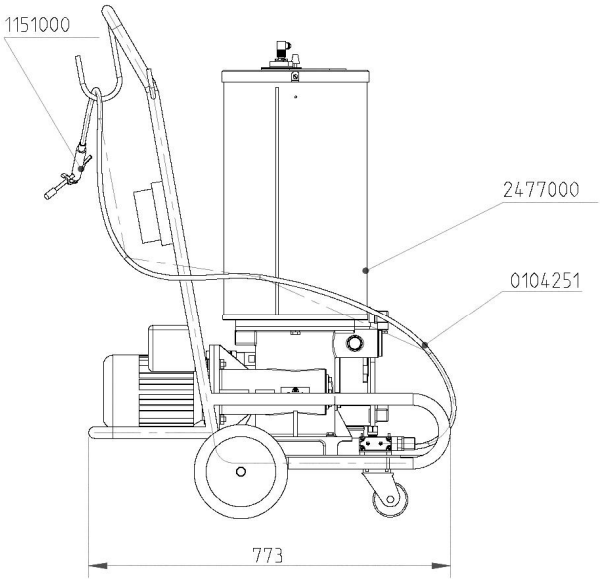
Photo 2

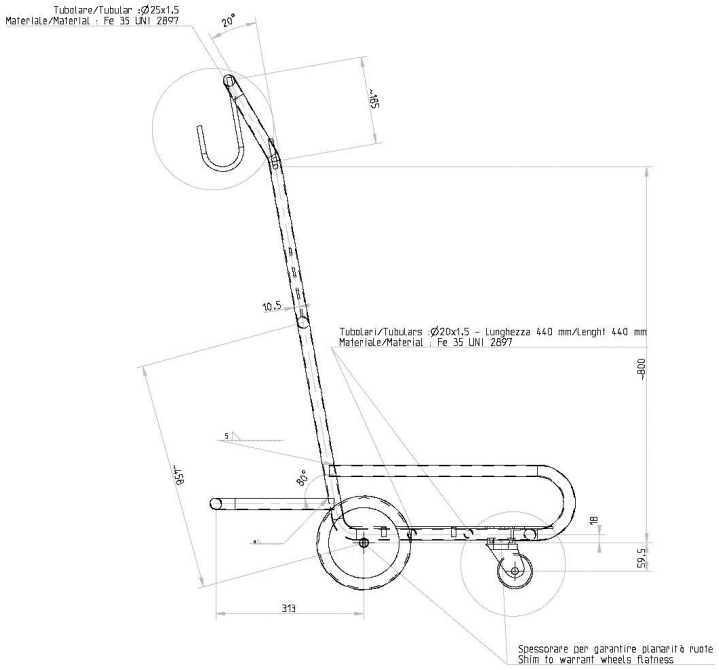
Sumo 30 kg

2.1 TROLLEY MOUNTED VERSION

Sumo Pump trolley mounted 30 Kg metal reservoir; the system is complete with electrical control equipment that allows the pump motor to be switched off when maximum pressure has been reached and dispensing lever is closed.





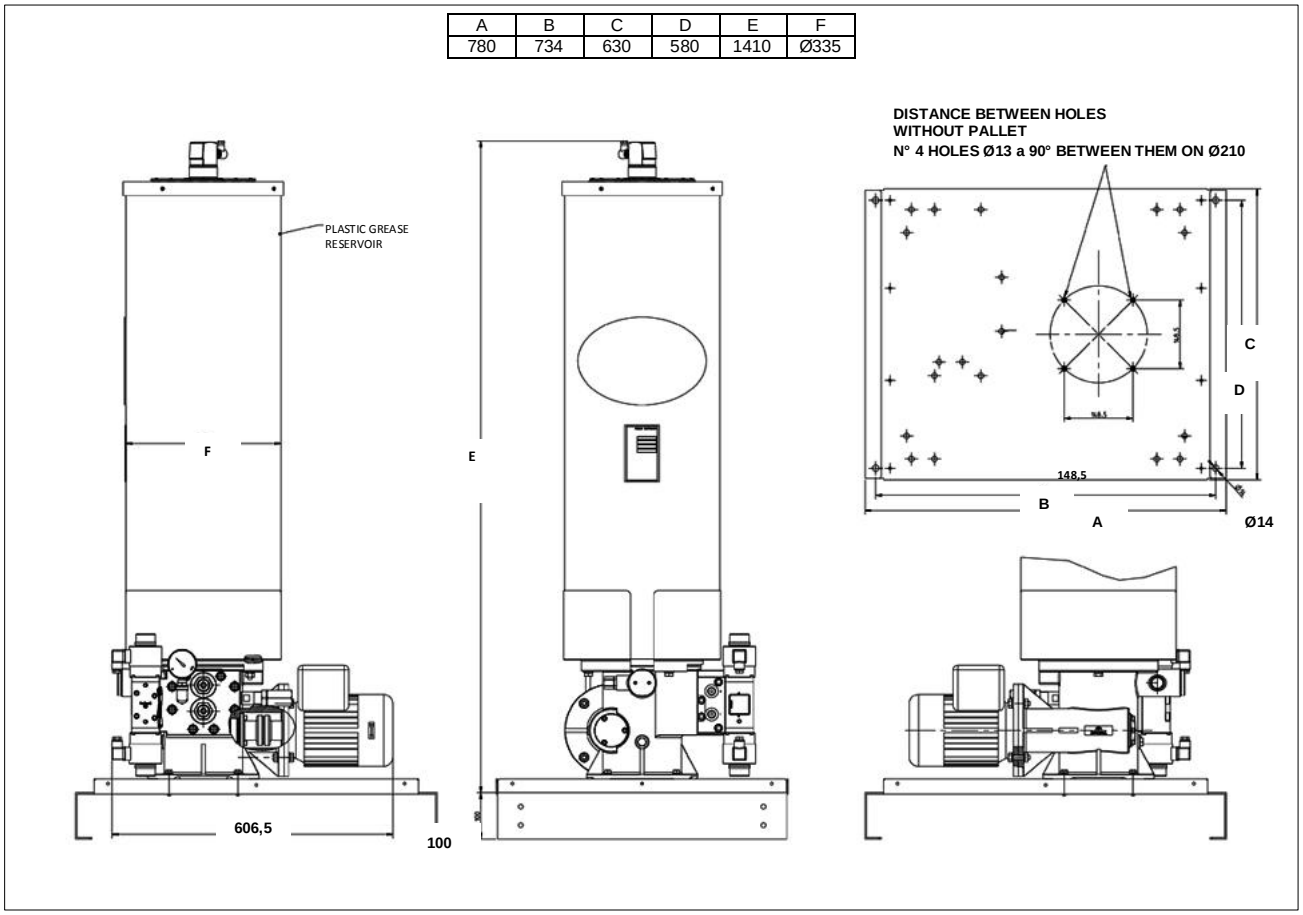


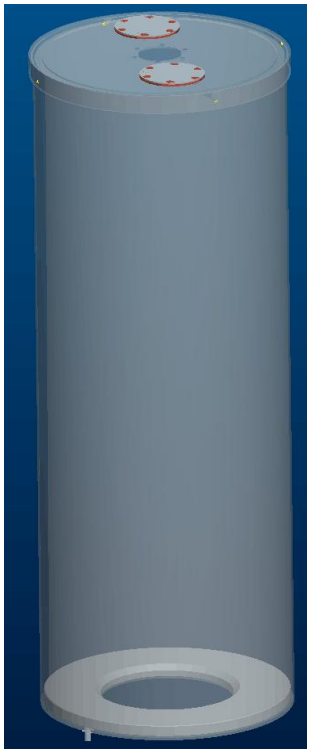
Sumo Pump 30 kg trolley mounted

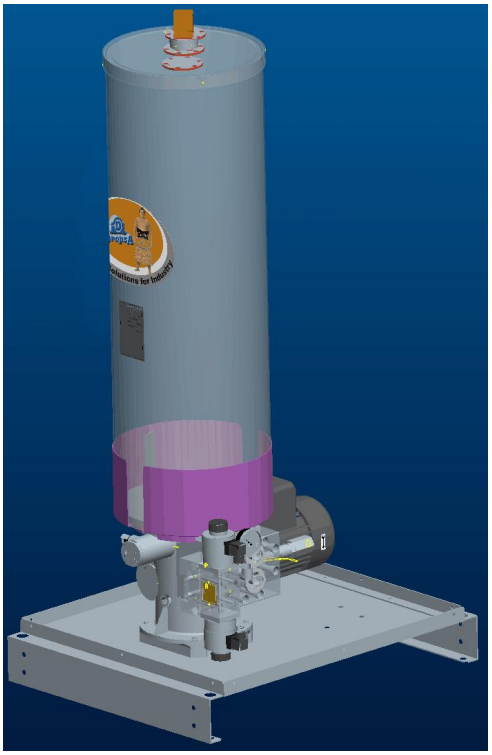
2.2 TRANSPARENT RESERVOIR VERSION

Sumo Pump 80 Kg with transparent reservoir made of polyethylene for special applications.

A	B	C	D	E	F
780	734	630	580	1410	Ø335







3. IDENTIFICATION OF THE MACHINE

On the front part of the pump tank there is a plate which indicates the product code, the supply voltage and the basic characteristics.

4. TECHNICAL CHARACTERISTICS

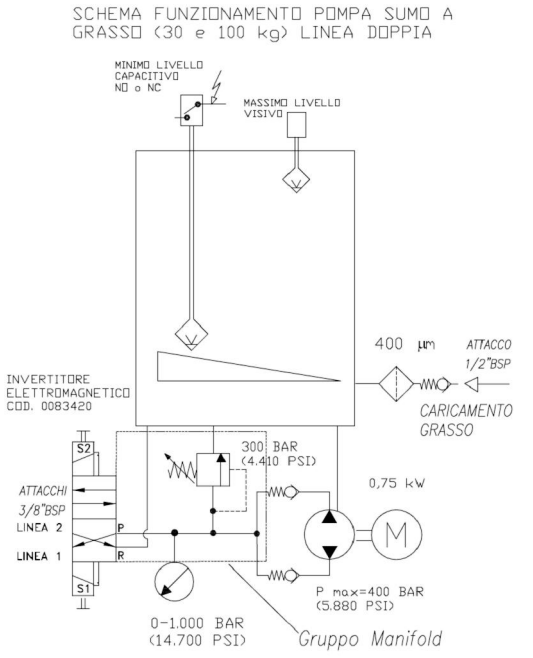
The pump consists of a series of components with the following characteristics:

Technical characteristics	
Max. pressure	400 bar
Outlet delivery	400 cm^3 / min (24 cu. in/min) (2 x 200 cm^3 (12 cu. in) pump modules)
Working temperature	da - 5° C a + 50° C (da 23° F a +122° F)
Working humidity	90% max
	Mineral oil lubricants
Viscosity at working temperature	Min. 32 cSt
	Grease lubricants
Viscosity at working temperature	NGLI 2 Max.
Degree of protection	IP 55
Electric motor	Three phase Power 0.75kW Protection IP55 class B Voltage: 230-400 Volt ± 5% 50 Hz 240-440Volt ± 5% 60 Hz S1 continuous service.

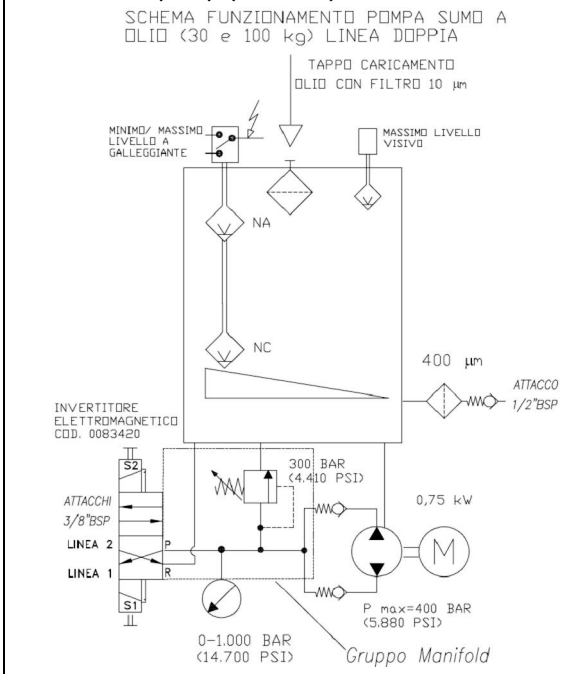
***N.B.:* do not supply the machine with voltages and pressures different from those indicated on the plate.**

4.1 HYDRAULIC FUNCTION DIAGRAM

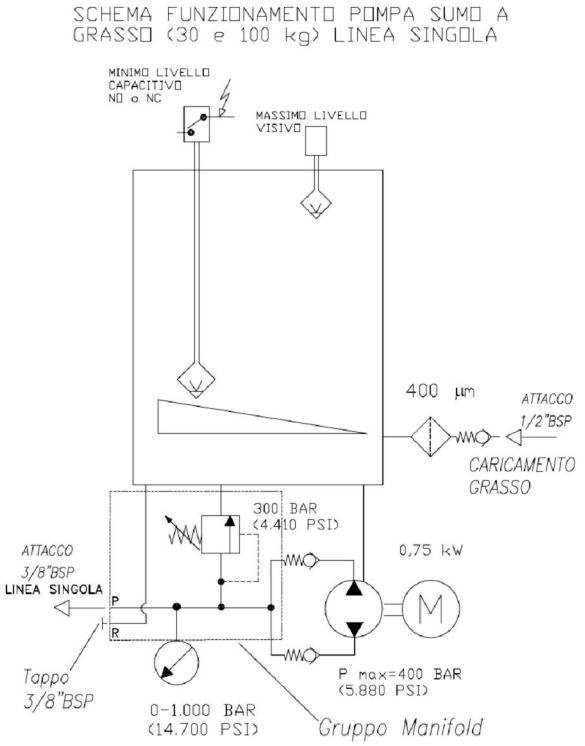
Standard grease pump (dual line)



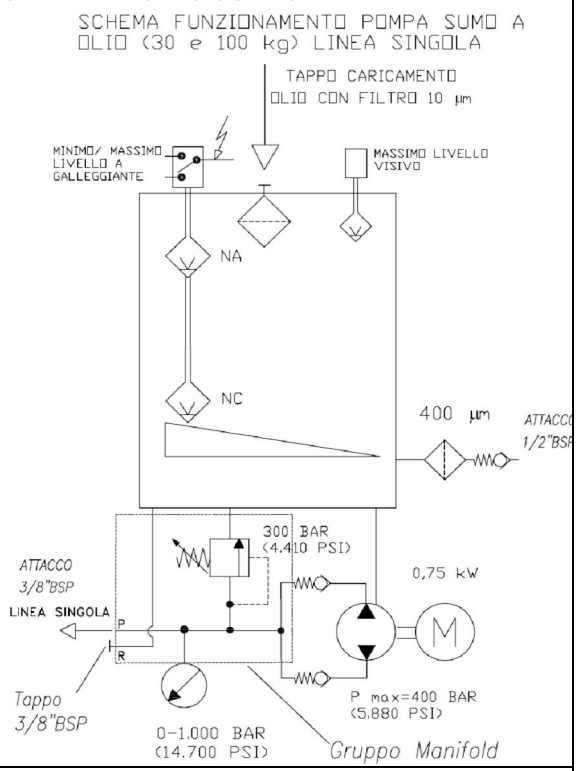
Standard oil pump (dual line)



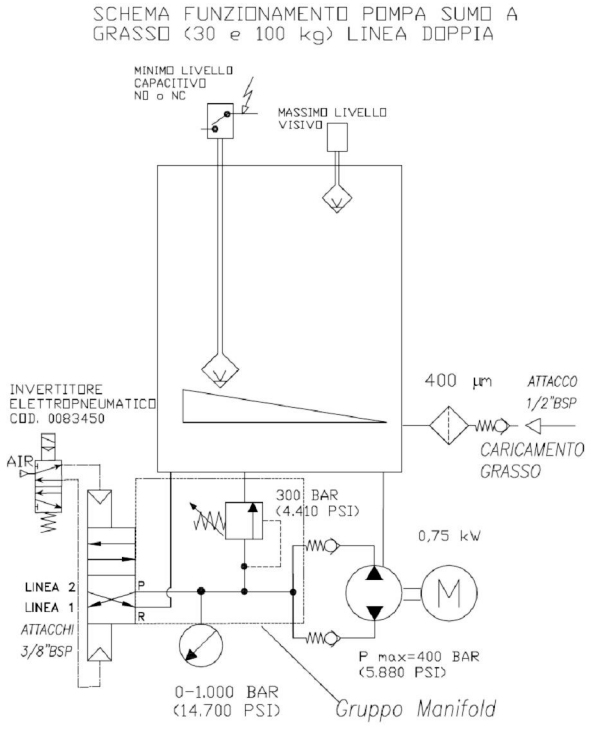
Single outlet grease pump (option).



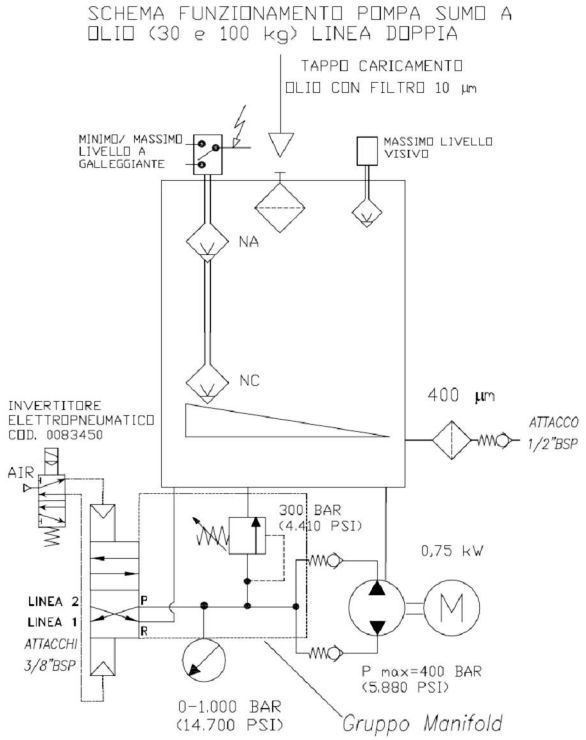
Single outlet oil pump (option).



Grease pump (options: dual line, electropneumatic inverter).



Oil pump (options: dual line, electropneumatic inverter).



5. PUMP COMPONENTS

5.1 FIXED DELIVERY PUMPING ELEMENTS

The pump has two fixed delivery standard pumping elements (200 cm^3/ min for each pumping element). A piston slides inside the body of the pumping element coupled to the latter by a lapping process. The seal between the piston and the pumping body is of a dry type, with no gasket provided between the two. The pumping element retention valve is of the tapered seal type. This solution is able to guarantee an optimum seal for the system at high operating pressures (max. pressure of 400 bar). The pumping elements are assembled on the manifold unit with a threaded attachment, which facilitates its assembly/ dismantling.

5.2 ENDLESS SCREW / WORM WHEEL UNIT

The pump has endless screw-worm wheel working kinematics with a transmission ratio of 1/40. The screw is made from special steel with high mechanical resistance, which gives it optimum flexible rigidity. To guarantee high resistance to wear, the screw has been subjected to Tenifer wear-resistant treatment. The screw is supported by oblique contact ball bearings, duly preloaded, to reduce working clearance. The worm wheel is made of bronze alloy for gear systems, particularly suitable for making the pump run quietly. The worm wheel shaft is made of special high resistance steel which gives the pump better reliability and durability.

5.3 INVERTORS

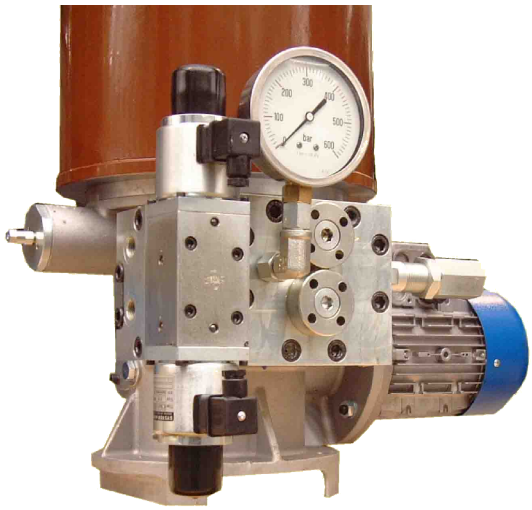
Code	Description
Series 0083420	Interchangeable electromagnetic inverter (mounted as standard on SUMO pump
Series 0083400	Electromagnetic inverter
Series 0083450	Electropneumatic inverter

Spare parts			
Code	**Description**	**Current (A)**	**Power (W)**
3150011	Electromagnet 24V DC	7	170
3150012	Electromagnet 110V AC 50/60 Hz	2	206
3150013	Electromagnet 230V AC 50/60 Hz	1	176
3133262	Seal kit		

GENERAL NOTE FOR ALL INVERTERS: *It is advisable to plan a delay in the de-energizing of the electromagnets from 2 - 5 sec. to allow complete inversion in relation to the closing time of the pressure gauge at the end of the line.*

5.3.1 Interchangeable electromagnetic inverter (code 0083420 mounted on standard pump)

The standard pump is prepared for dual line function, with an electromagnetically controlled inverter being assembled as standard. The inverter can be replaced if it is not working efficiently, without disconnecting the two line pipes (of an interchangeable type). This is able to reduce maintenance times and the relating installation shutdown.

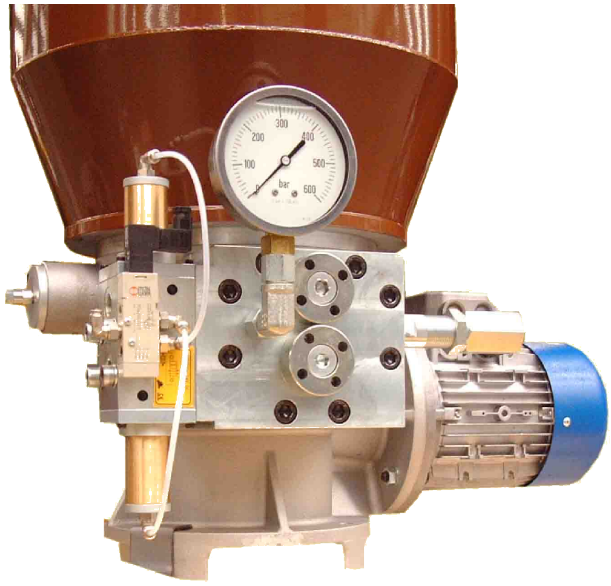
This version means that the inverter can be replaced without disconnecting the line pipes. A solution of this type offers the following advantages: • Ease of assembly and dismantling (only the 4 front Allen screws need to be loosened and tightened); • Short replacement time; • Minimum installation shutdown time.	*Photo 3* 

5.3.2 Electromagnetic inverter (code 0083400 option)

Photo 4 	The main parts of the inverter are: • A body with a central lapping hole which allows the dry seal to be coupled to the inversion piston; • a ground piston with a dual coupling surface, with openings which are able to improve lubrication and seal at high pressures; • the inversion phase is facilitated by the presence of a balancing system; • by seal gaskets manufactured to sustain high pressures, via a pressure chamber, optimising the inverter operations; • two control electromagnets equipped with a thermal probe with an intervention temperature of 100°C (protecting the coils from overheating).

5.3.3 Electropneumatic inverter (code 0083450 option)

Photo 5



The main parts of the device are:

- See point 5.3.2;
- two simple effect pneumatic actuation cylinders, controlled by a 5/ 2 type electrovalve.

Spare electrovalves	
Code	Description
3155154	Solenoid 24V DC
3155155	Solenoid 24V AC 50/60 Hz
3155156	Solenoid 110V AC 50/60 Hz
3155157	Solenoid 230V AC 50/60 Hz

5.4 PRESSURE CONTROL VALVE MOUNTED ON THE PUMP

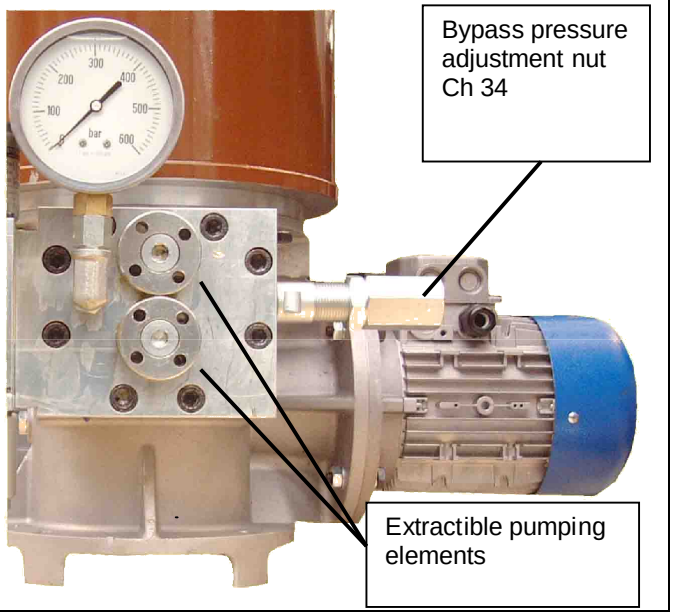
Pump group unit

The pump has a pressure control valve, mounted on the manifold unit on the right side of the pumping elements. The valve can be easily dismantled for inspection if required. It is calibrated by turning the bypass pressure adjustment nut:

- clockwise (increase of pressure)
- anticlockwise (decrease of pressure)

Once the bypass has been calibrated, the position of the pressure adjustment nut is locked using a lock nut. It is important to bear in mind that line inversion is controlled by closing the contacts of the pressure switch. Adjusting the pressure switch provides an operating pressure which is lower than the maximum pressure controlled by this valve.

Photo 6



Code	Description
3191311	Pressure 100 ÷ 450 bar (1470 ÷ 6615psi)
3191314	Pressure 50 ÷ 200 bar (735÷ 2940 psi) on request

5.5 PUMPING ELEMENTS WITH FIXED AND VARIABLE DELIVERY.

The standard pump has two pumping elements with fixed delivery (Image 1). On request it is possible to have a solution with variable delivery (Image 2). The pump can offer variable delivery by replacing a pumping element with fixed delivery with one with variable delivery.

Ref.	Code	Description
Image 1	295060	Pumping element with variable delivery 100- 200 cm^3/min
Image 2	295040	Pumping element with fixed delivery 200 cm^3/min

The main parts of the pumping element with variable delivery are:

- External body of the pumping element assembled with seal threading on the manifold group;
- Internal body of the pumping element equipped with delivery adjustment with threaded screws;
- Piston;
- Non-return valve manufactured with tapered cone seal system;
- Spring which guarantees contact between the piston and the control excentric gear.

Ref.	Code	Description	Code	Description
Image 1	0295040	Fixed pumping element unit	3190491	OR 2187 gasket in polyurethane CHPU95
			0295024	Stop valve cap
			3191312	Tapered spring
			0295023	Valve cone
Image 2	0295060	Variable pumping element unit	3190491	Gasket OR 2187 in polyurethane CHPU95
			3190494	Gasket OR 3156 in polyurethane CHPU95
			3190495	Gasket OR 3118 in polyurethane CHPU95
			0295035	Stop valve cap
			3191312	Tapered spring
			0295023	Valve cone

Fixed delivery pumping element code 0295040

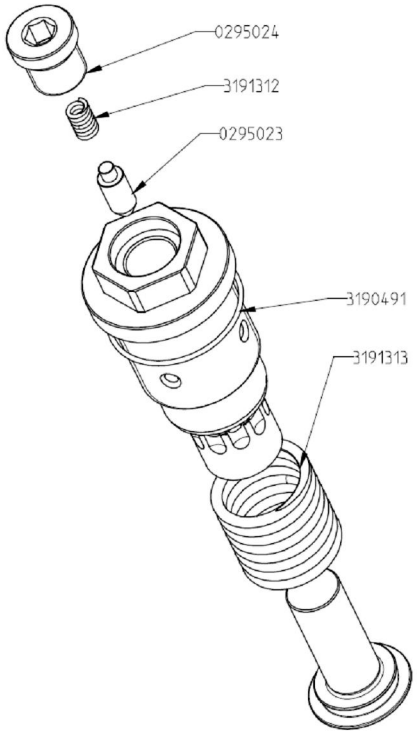


Image 1

Variable delivery pumping element code 0295060

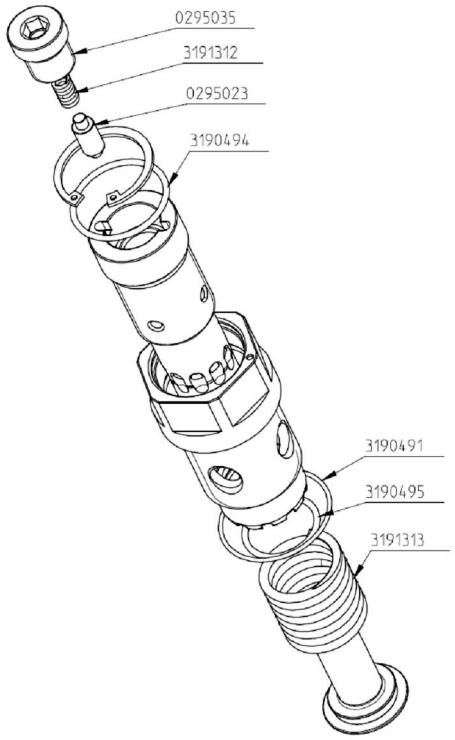


Image 2

5.6 ADJUSTMENT OF PUMPING ELEMENT DELIVERY.

Delivery is adjusted by unscrewing (reducing delivery) or tightening (increasing delivery) the internal pumping element: each complete turn corresponds to an 11.5% change in delivery. There are two references on the fixed and mobile pumping element bodies (Photo 8) which allow identification of rotation at every ¼ turn (90°). The internal pumping element possesses a threaded adjustment of M36x2: each complete turn corresponds to an adjustment of the pumping elementôs stroke of 2 mm. We use the reference height obtained with calibration, between the exterior of the fixed pumping element and the exterior of the internal pumping element (height X). We use Y to indicate the actual displacement of the internal pumping element (Y=13-X).

X height measured mm	Y= 13-X pumping element adjustment stroke	% variation of delivery per pumping element	Actual stroke of pumping element mm	Effective pumping element delivery Cm^3/ min
13	0	0	17.5	200
11	2	11.5	15.5	176
9	4	23	13.5	154
7	6	34.5	11.5	132
5	8	46	9.5	108

N.B. Delivery values are valid in the absence of outgoing counterpressure.

Photo 7

Photo 8

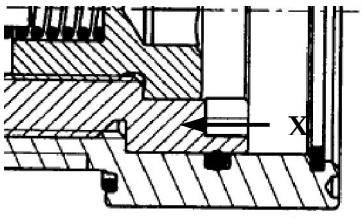


Image 3

5.7 MAXIMUM AND MINIMUM GREASE LEVEL INDICATORS

Standard grease pumps have two types of level:

- Minimum capacitive level;
- Maximum visual level (float).

Code	Description
0295100	Maximum visual level kit (float).
0295120	Minimum capacitive level kit per tank kg 30 (68.1 lb.)
0295110	Minimum capacitive level kit per tank kg 100 (100.02 kg.)
3289166	Capacitive probe

5.7.1 Minimum capacitive level

The minimum level is produced by a capacitive probe, positioned on the end of a pipe mounted on the tank cover. The capacitive probe is normally closed. When it reaches the minimum level the probe indicates a lack of lubricant. To make the solution valid for NLGI2 grease as well, the capacitive probe interfaces with the scraper whose function is to clean the lower face of the grease probe. If the capacitive probe is replaced then it must be recalibrated (see calibration procedure).
The minimum level contact is indicated by a light signal on the control panel. In addition it controls any command for the pump to automatically refill the tank.

5.7.2. Maximum visual level (floating)

The phase for loading the lubricant into the tank is carried out by the operator, with an appropriate pump. Once the maximum level of lubricant has been reached, the small rod which indicates that the tank is full intervenes.

5.8 INDICATORS OF MINIMUM AND MAXIMUM OIL LEVEL.

Standard oil pumps have two types of level:

- Minimum and maximum level float;
- Maximum visual level (float).

Code	Description
0295100	Maximum visual level kit (float).
0295033	Maximum visual level float
0295150	Level float kit for 30 kg tanks (68.1 lb.) (minimum and maximum level)
0295160	Level float kit for 100 kg tanks (68.1 lb.) (minimum and maximum level)

5.8.1 Minimum and maximum level float

A probe rod with dual float mounted on the pump cover provides a reading of the minimum oil level (reserve) and the maximum level (which allows the automatic refilling of the tank to be halted).
The minimum level contact is indicated by a light signal on the control panel. In addition it controls any command for the pump to automatically refill the tank.

5.8.2. Maximum visual level (floating)

See point 5.7.2.

5.7 Stirring paddle for grease and oil (standard performance)

Four tanks are provided with a capacity of 30 and 100 kg. (22 ï 66.1 ï 220.4 lb) two for oil and two for grease.
The tanks have a stirring paddle and scraper as standard, and they must not be dismantled when they are being assembled and replaced. Under the stirring paddle a galvanized steel mesh with 0.5 mm holes (0.02 in.) is provided as standard. In this way the pump is protected from any foreign bodies which might be inadvertently present during the tank refilling process.

5.8 PRESSURE GAUGE

The pressure gauge is of the glycerin filled type, so it is protected from any pressure leaks which might damage its functioning. It is mounted directly in the manifold group (positioned on the front of the pump).

Code	Description
3292078	1000 bar (0 -14.700 psi)

5.9 ELECTRICAL CONTROL PANEL

ñDROPSAò electrical control panel has been designed to provide a system complete with all the controls necessary for automatic functioning controlled by safety signals from centralized lubrication installations. The primary voltage is 400 VAC and 50 Hz, the other voltages are on request.

Type of probe	Type of inverter	Voltage V	Code Electrical apparatus	Code Electric diagram
CAPACITIVE PROBE	electromagnetic	24 VDC	1637008	1327252
		110 VAC	1637009	1327253
		220 VAC	1637010	1327254
	electropneumatic	24 VDC	1637011	1327255
		110 VAC	1637012	1327256
		220 VAC	1637013	1327257
LASER PROBE	electromagnetic	24 VDC	1637001	1327237
		110 VAC	1637003	1327247
		220 VAC	1637004	1327248
	electropneumatic	24 VDC	1637005	1327249
		110 VAC	1637006	1327250
		220 VAC	1637007	1327251

6. UNPACKING AND INSTALLATION

WARNING: The unit is only to be opened and repaired by specialist personnel.

No pump assembly operations are envisaged. The pump is fixed on a metal pallet, which allows safe handling using a transpallet or forklift truck. This pallet has been designed so that it can be installed in the installation, being equipped with 4 (four) holes of Ø 14 mm suitable for fixing to the floor. Provide adequate space (as shown on the installation diagram) to avoid abnormal posture or possible impact. Then, as described previously, the pump must be connected hydraulically to the machine and then connected to the control panel.

7. INSTRUCTIONS FOR USE

7.1 GOING INTO OPERATION

Damage to the supply cable and housing may involve contact with live parts at high voltage and consequently fatal danger:

- Check the integrity of the supply cable and the unit prior to use;
- If the supply cable or the unit is damaged, do not start up the system!
- Replace the damaged supply cable with a new one;
- The unit can be opened and repaired only by specialist personnel;
- In order to prevent the danger of electrocution due to direct or indirect contact with live parts the electric supply line must be adequately protected by an appropriate magnetothermal differential switch with threshold of intervention of 0.03 ampere and max intervention time of 1 second;
- The *interruption power of the switch must be* ≤ 10 *kA and rated current In = 6 A.*
- The pump must not be used when submerged in fluids or in a particularly aggressive or explosive/inflammable atmosphere unless prepared in advance for this purpose by the supplier;
- to fix the pump correctly check the pitch dimensions shown in the figures in chapter 12;
- Use safety gloves and goggles as indicated in the safety sheet for the lubrication oil;
- Do NOT use lubricants which are aggressive towards NBR gaskets, and if in doubt consult the Dropsa SpA technical office which will supply a detailed list of the recommended oils;
- Do not ignore dangers to health and comply with health and safety regulations;
- Warning! All the electric components must be earthed. This applies to both the electric components, and to the control devices. To this end make sure that the earth wire is connected correctly. For safety reasons the earth conductor must be approximately 100 mm longer than the phase conductors. If the cable is accidentally removed, the earth terminal must be the last one to be removed.

7.2 ACTION TO BE TAKEN BEFORE START-UP.

- Check the integrity of the pump.
- Refill the tank with suitable lubricant.
- Check that the pump is at working temperature and that there are no air bubbles in the pipes.
- Check that the electric connection has been carried out correctly.

7.3 USE.

- check the data sets imposed.
- press the start button on the machine to which the Sumo pump is connected.
- check pump start-up.
- check that the machine is adequately lubricated (if there are still some doubts about its correct functioning you can contact the Dropsa S.p.A Technical Office and request a test procedure).
- check that the direction of rotation of the electric motor is the one indicated by the indicator arrow, positioned on the protective housing of the motor fan;
- check that the hydraulic connection is correct.

7.4 ADJUSTMENT/ CALIBRATION OF LEVEL PROBES

7.4.1 Pressure

It is possible to adjust working pressure by rotating the bypass screw clockwise to increase pressure or anticlockwise to reduce pressure. During this operation pay attention to the pressure gauge positioned on the edge of the pump.

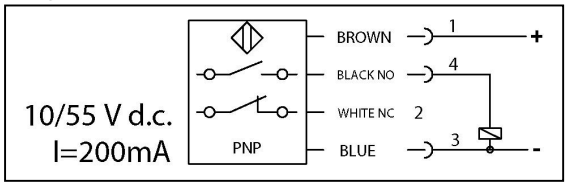
7.4.2 Procedure for calibrating the capacitive probe

Before being assembled the capacitive probe must be calibrated in accordance with the following sequence:

1. connect the sensor electrically;
2. immerse the sensor in the lubricant, down to half of its length;
3. remove the sensor from the lubricant until it skims the surface of the lubricant;
4. at this point there can be two possible types of operation:
   - the sensor status does not change: its sensitivity must be reduced (by acting on the screws for adjusting sensor sensitivity) until its state of excitation is reached
   - if its status changes, the sensor already possesses the correct sensitivity
5. after checking that the sensor has been correctly read, the sensor reading must be repeated at least three times
6. Tighten the capacitive probe on the probe carrier rod, complying with the following assembly height:
   - 450 mm (from below the cover up to the lower surface of the sensor) for a 30 kg tank
   - 900 mm (from below the cover up to the lower surface of the sensor) for a 100 kg tank

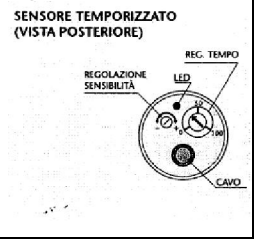
Operating instructions for the capacitive probe (model SC18M-C5 PNP NO + NC)

Image 4



General information about operations C ï A - R

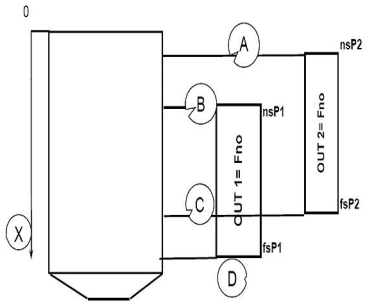
Sensors operating under C for continuous current (4 wires)

They are sensors which are amplified in continuous current and which incorporate, in addition to the oscillator, the outlet amplifier. They are supplied with 4 wires with an antivalent function in the NPN or PNP versions. In this operation the sensors offer as standard characteristics protection against permanent short circuit of the load, absolute safety against inversion of polarity and protection from the peaks produced by disconnecting inductive loads. They can be supplied together with model ALNC ï ALTP feeders. They are compatible with programmable controller inputs.	*Image 5* 

7.4.3 Procedure for calibrating the laser probe

The laser probe possesses a representative and programming display mounted on board. It is possible to operate in analogue mode (with signal from 4 to 20 mA) or in digital mode (two outputs and four intervention thresholds).
We attach a table showing the calibration parameters for the laser probe, for 30 and 100 kg tank.

Image 6

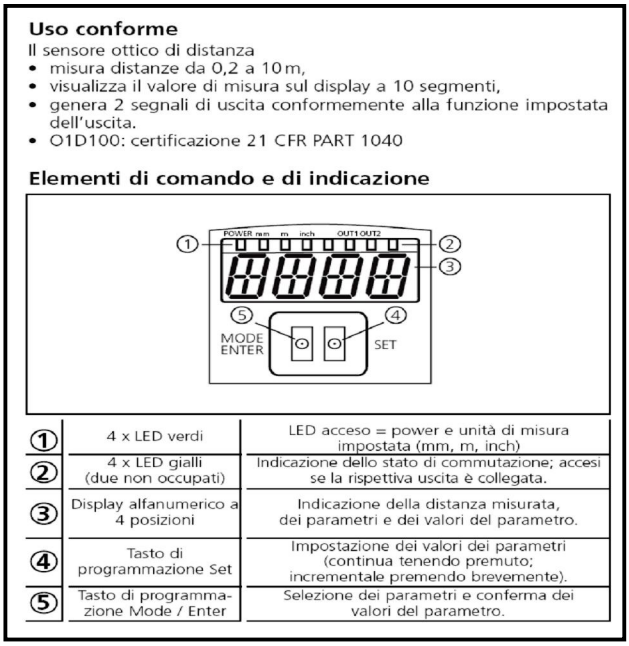


LASER PROBE CALIBRATION							
				30 kg tank		100 kg tank	
Pos.	**Level**	**Output signal**	**set-up**	**height X [mm]**	**Quantity of grease [kg]**	**height X [mm]**	**Quantity of grease [kg]**
A	Maximum absolute level	OUT 2= Fno	nsP2	200	22	200	81
C	Minimum level		fsP2	370	11	700	25
B	Maximum level	OUT 1= Fno	nsP1	230	20	230	78
D	Minimum absolute level		fsP1	420	8	800	14

***N.B.*: In the 30 kg pump tank at minimum absolute level there is still a reserve of 7 kg.**
In the 100 kg pump tank at absolute minimum level there is still a reserve of 15 k.g

Operating instructions for the IFM laser probe model O1D100 (code 3289172)

Image 7



Uso conforme

Il sensore ottico di distanza
- misura distanze da 0,2 a 10 m,
- visualizza il valore di misura sul display a 10 segmenti,
- genera 2 segnali di uscita conformemente alla funzione impostata dell'uscita.
- O1D100: certificazione 21 CFR PART 1040

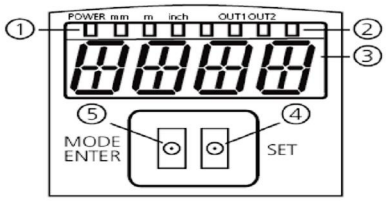
Elementi di comando e di indicazione

①	4 x LED verdi	LED acceso = power e unità di misura impostata (mm, m, inch)
②	4 x LED gialli (due non occupati)	Indicazione dello stato di commutazione; accesi se la rispettiva uscita è collegata.
③	Display alfanumerico a 4 posizioni	Indicazione della distanza misurata, dei parametri e dei valori del parametro.
④	Tasto di programmazione Set	Impostazione dei valori dei parametri (continua tenendo premuto; incrementale premendo brevemente).
⑤	Tasto di programmazione Mode / Enter	Selezione dei parametri e conferma dei valori del parametro.

Uso conforme

Il sensore ottico di distanza
- misura distanze da 0,2 a 10 m,
- visualizza il valore di misura sul display a 10 segmenti,
- genera 2 segnali di uscita conformemente alla funzione impostata dell'uscita.
- O1D100: certificazione 21 CFR PART 1040

Elementi di comando e di indicazione



①	4 x LED verdi	LED acceso = power e unità di misura impostata (mm, m, inch)
②	4 x LED gialli (due non occupati)	Indicazione dello stato di commutazione; accesi se la rispettiva uscita è collegata.
③	Display alfanumerico a 4 posizioni	Indicazione della distanza misurata, dei parametri e dei valori del parametro.
④	Tasto di programmazione Set	Impostazione dei valori dei parametri (continua tenendo premuto; incrementale premendo brevemente).
⑤	Tasto di programmazione Mode / Enter	Selezione dei parametri e conferma dei valori del parametro.

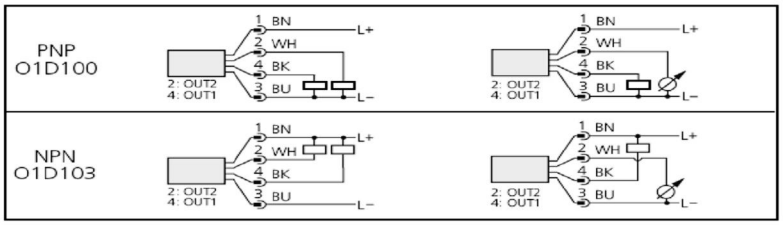
Funzioni dell'uscita

	Uscita 1	Uscita 2
Funzione di commutazione: uscita 1 / 2 rispettivamente commutabile p o n; funzione impostabile in modo separato per ogni uscita		Funzione di isteresi / NO (**Hno**)
		Funzione di isteresi / NC (**Hnc**)
		Funzione di finestra / NO (**Fno**)
		Funzione di finestra / NC (**Fnc**)
Funzione analogica: solo uscita 2	—	**I**: 4 ... 20 mA
		U: 0 ... 10 V

Collegamento elettrico

L'apparecchio deve essere installato soltanto da un tecnico elettronico.
Osservate le disposizioni nazionali ed internazionali per l'installazione di impianti di elettrotecnica.
Alimentazione di tensione secondo EN50178, SELV, PELV.
O1D100: cULus, Supply Class 2

Disinserite l'impianto dalla tensione e collegate l'apparecchio come descritto di seguito.



Colori dei fili dei connettori femmina ifm:
1 = BN (marrone), 2 = WH (bianco), 3 = BU (blu), 4 = BK (nero).

ATTENZIONE: se l'uscita 2 viene collegata ad una scheda dell'ingresso analogico, l'uscita deve essere precedentemente parametrizzata (**OU2= I** oppure **OU2 = U**). In caso contrario è possibile che la scheda dell'ingresso venga distrutta.

Instructions for calibrating the Laser Probe O1D100

Rotate the wording on the Display by 180°.

1. Press the **MODE ENTER** key 7 times: **EF.** appears on the Display.
2. Press the **SET** key.
3. Press the **MODE ENTER** key 5 times: **diS.** appears on the Display.
4. Press the **SET** key. **d3.** appears on the Display.
5. Keep the **SET** button pressed down for 5 sec.
6. When the wording on the Display no longer flashes, press **SET** once.
7. **rd1.** appears on the Display.
8. Press **MODE ENTER** once.
9. Check that the Display wording has rotated by 180°.

Calibrate outlet 1 (OUT 1) operating with window nsP1 (B) & fsP1 (D) (see Calibration table for Laser probe)

1. Press the **MODE ENTER** key once: **OU1** appears on the Display.
2. Keep the **SET** button pressed down for 5 sec.
3. When the wording on the Display no longer flashes, press **SET** twice until **Fno** appears on the Display.
4. Press the **MODE ENTER** key once: **nsP1** appears on the Display.
5. Keep the **SET** button pressed down for 5 sec.
6. When the wording on the Display no longer flashes, press **SET** once.
7. The value of the height read appears on the Display.
8. Press the **SET** button until the desired height appears.
9. Press the **MODE ENTER** button once and the height set is memorised.
10. Press the **MODE ENTER** key once: **fsP1** appears on the Display.
11. Repeat the previous points from N° 5 to N° 9.

Calibrate outlet 2 (OUT 2) operating with window nsP2 (A) & fsP2 (C) (see Calibration table for Laser probe)

1. Press the **MODE ENTER** key once: **OU2** appears on the Display.
2. Keep the **SET** button pressed down for 5 sec.
3. When the wording on the Display no longer flashes, press **SET** 4 times until **Fno** appears on the Display.
4. Press the **MODE ENTER** key once: **nsP2** appears on the Display.
5. Keep the **SET** button pressed down for 5 sec.
6. When the wording on the Display no longer flashes, press **SET** once.
7. The value of the height read appears on the Display.
8. Press the **SET** button until the desired height appears.
9. Press the **MODE ENTER** button once and the height set is memorised.
10. Press the **MODE ENTER** key once: **fsP2** appears on the Display.
11. Repeat the previous points from N° 5 to N° 9.

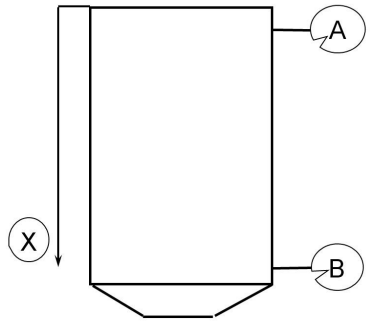
7.4.4 Procedure for calibrating the ultrasound probe model ZWS-70/CI/QS (code 3289173)

Before being assembled the probe must be calibrated in accordance with the following sequence:

1. electrically connect the sensor (following the electric diagram shown below);
2. keep the sensor button pressed down until the two LED (green and yellow lights) flash together;
3. position it in front of the minimum absolute level to be read, entering the height by releasing the button (the two LEDs display a fixed light);
4. press the button for 3 or 4 seconds (the probe has acquired the Minimum absolute level);
5. keep the sensor button pressed down until the two LED (green and yellow lights) flash together;
6. position it in front of the maximum absolute level to be read, entering the height by releasing the button (the two LEDs have a fixed light);
7. press the button for 3 or 4 seconds (the probe has acquired the Maximum absolute level);
8. In this way the sensor is calibrated.

N.B.: green Led on indicates that the probe is supplied. Yellow Led on indicates operating mode for reading.
We attach a table with the calibration parameters for the ultrasound probe, for 30 and 100 kg tanks.

Image 8



Calibration of ultrasound probe						
Pos.			***30 kg tank***		***100 kg tank***	
	Level	***Output signal***	***height X [mm]***	**Quantity of grease [kg]**	***height X [mm]***	**Quantity of grease [kg]**
A	Maximum absolute level	Threshol d1	50	26	50	95
B	Minimum absolute level	threshold 2	420	0	800	0

***N.B.*: In the 30 kg pump tank at the minimum absolute level there is still a reserve of 7 kg.**
In the 100 kg pump tank at the minimum absolute level there is still a reserve of 15 kg.

Photo 9

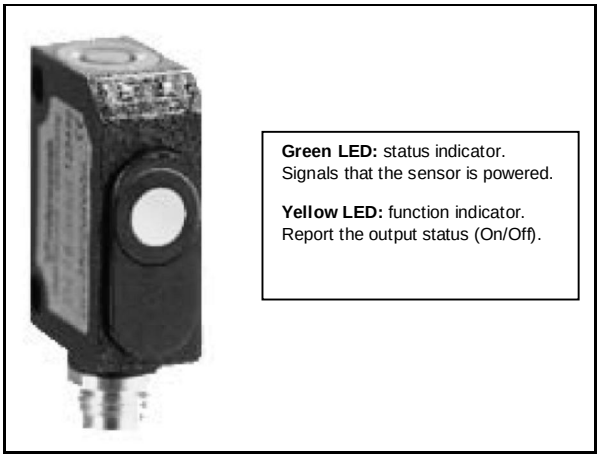
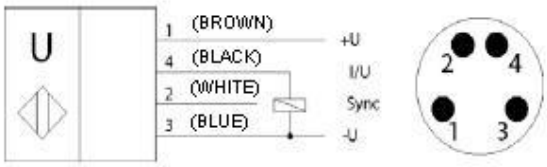
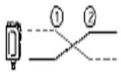

Green LED: status indicator.
Signals that the sensor is powered.
Yellow LED: function indicator.
Report the output status (On/Off).

Image 9





Window setting:

START

Place the object on the threshold (1)

During the operational phase, the sensor detects only objects between this threshold and (2)

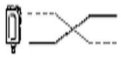
Press the button for about 3 seconds until the LED blink simultaneously.
(*The LED flashes*)

Place the object on the threshold (2)

During the operational phase, the sensor detects only objects between this threshold and (1)

Press the button for about 1 sec., then release it.
(*The sensor returns to operation*)

END



Output feature selection in ascending or descending:

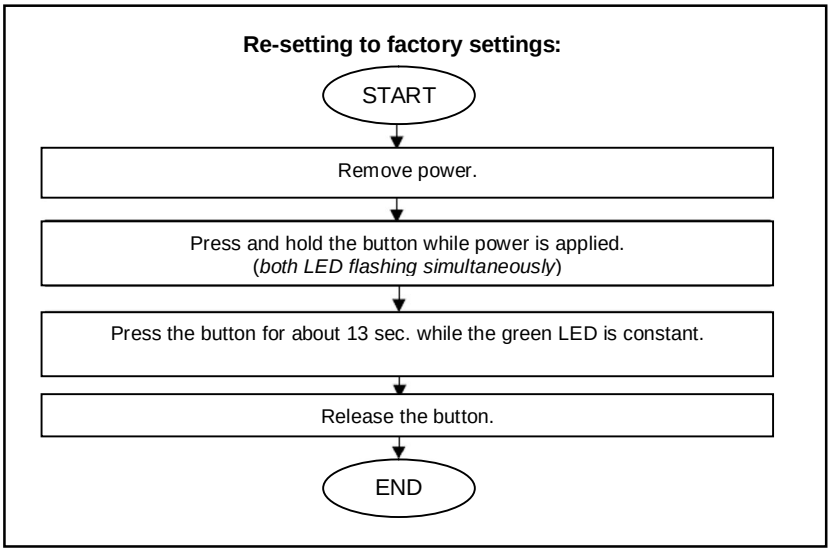
START

Press the button for about 13 sec. until the LED blink simultaneously .
(Only *the green LED flashes*)

Press the button (for about 1 sec.) to choose between NA and NC.
Yellow LED: on= ascending
off= discending

Wait 10 sec.

END


Re-setting to factory settings:
START
Remove power.
Press and hold the button while power is applied.
(both LED flashing simultaneously)
Press the button for about 13 sec. while the green LED is constant.
Release the button.
END

8. PROBLEMS AND SOLUTIONS

Below is a diagnostic table showing the main faults, the probable causes and the possible solutions.
In the event of doubts and/or problems which cannot be solved, do not proceed to look for the fault by dismantling parts of the machine, but contact the Dropsa Technical Office.

Fault	Cause	Solution
The electric pump is not delivering any lubricant.	The electric motor is not functioning.	Check the connection between motor and electric supply line. Check the motor winding. Check that the connection plates for the motor terminal box are positioned in accordance with the supply voltage.
	The tank is empty.	Fill the tank. N.B.: If the tank was emptied without the electric signal for reaching the minimum level being given, the minimum level contact must be checked.
	The pump is not triggered. Causes of the pump's failure to trigger: • The motor is turning in an inverted direction (clockwise); • The motor is turning in the right direction but the stirring paddle is not turning; • Presence of air bubbles in the lubricant.	Remove the cover from the tank and check that the stirring paddle is turning anticlockwise and that the lubricant is moving; if not invert two of the three motor phases. See above. Remove the pump delivery pipe and drain off the lubricant until the air bubbles have been eliminated.
	The pressure adjustment valve (bypass) has been calibrated at too low a value Presence of dirt in the non-return valve.	
The pump will not go under pressure.	Possible dirt on the cone of the pump stop valve	Clean the cone and the pumping element stop valve housing, draining off the lubricant.
	Internal gasket between pumping element and manifold unit broken.	Replace the gasket (code 3190489).

Fault	Cause	Solution
No signal indicating minimum level when there is no lubricant in the tank.	Incorrect adjustment of minimum level.	Check the correct functioning of the level probe in the following way: Dismantle the minimum level unit and recalibrate the capacitive probe.
Selection of minimum level, with lubricant below the minimum and pump working.	Incorrect adjustment of minimum level.	The light on the control panel is still on: check the electric connection and, if necessary, replace the capacitive probe.
Lubrication installation accessories		
METERING UNIT AG6 Alarm signal indicating non-delivery of lubricant. The small rods visible inside the metering unit turrets must move sequentially up and down and activate the control microswitch when the pump is working. If this is not the case the two outlets or the single outlet of that metering unit will not deliver lubricant.	Metering unit small piston jammed. Piping between metering unit outlet and point requiring lubrication obstructed. Pressure on the line too low (the lubricant is not delivered by any outlet or only by a few outlets). Metering unit arranged for two outlets by used for only one outlet.	Replace the metering unit with another one having the same characteristics. However it is advisable to make sure that the metering units have been correctly assembled, particularly with regard to fixing. Over-locking of the fixing screws may damage the met ering unit and cause the small piston to jam. Remove the outlet pipe and check to see if the metering unit is delivering lubricant. Change the pressure control valve adjustment (bypass) or the adjustment of the control pressure gauge (and of line). Check that, when one single outlet is used, the right pad is assembled and that the other outlet is sealed. See instruction sheet for AG6 metering units.
END OF LINE PRESSURE GAUGE The pressure gauge is not sending the signal to the electric command and control panel. The pressure gauge sends the signal before the end of the lubrication cycle.	Electrical connection incorrect. Incorrect adjustment of the control pressure gauge. The pressure value set is too high and the pressure adjustment valve (bypass) intervenes before the pressure gauge can be activated. Incorrect adjustment of the control pressure gauge. The pressure value set is too low.	Check the electrical connection. Reduce the pressure gauge calibration pressure until an electrical contact is obtained. Increase the pressure gauge calibration valve. The optimum calibration value is the one which allows a pressure of 50-70 bar (735 ï 1029 psi) at the end of the lubrication line.

9. MAINTENANCE PROCEDURES

Use the individual protective devices needed to avoid contact with mineral oil or grease.

Regular inspection
The following regular checks must be carried out:

Check	
the lubrication status	1000 hours
Cleanliness of the loading and suction filter	4000 hours

The machine does not require any special equipment for any checking and/or maintenance activity, however the recommendation is to use suitable equipment which is in a good condition in order to avoid causing damage to persons or machine parts (according to current regulation).
If necessary clean the tank paying due attention (when the machine is off and without it being possible to restart it).
Remember to reseal the tank once the operation has been completed.

Make sure that the electric and hydraulic supply has been disconnected before carrying out any maintenance intervention.

10. DISPOSAL

In the course of machine maintenance, or if the machine is scrapped, do not dispose of polluting parts into the environment. Refer to local regulations with regard to their correct disposal. When scrapping the machine the identification plate and any other documents must be destroyed.

11. INFORMATION ABOUT ORDERING

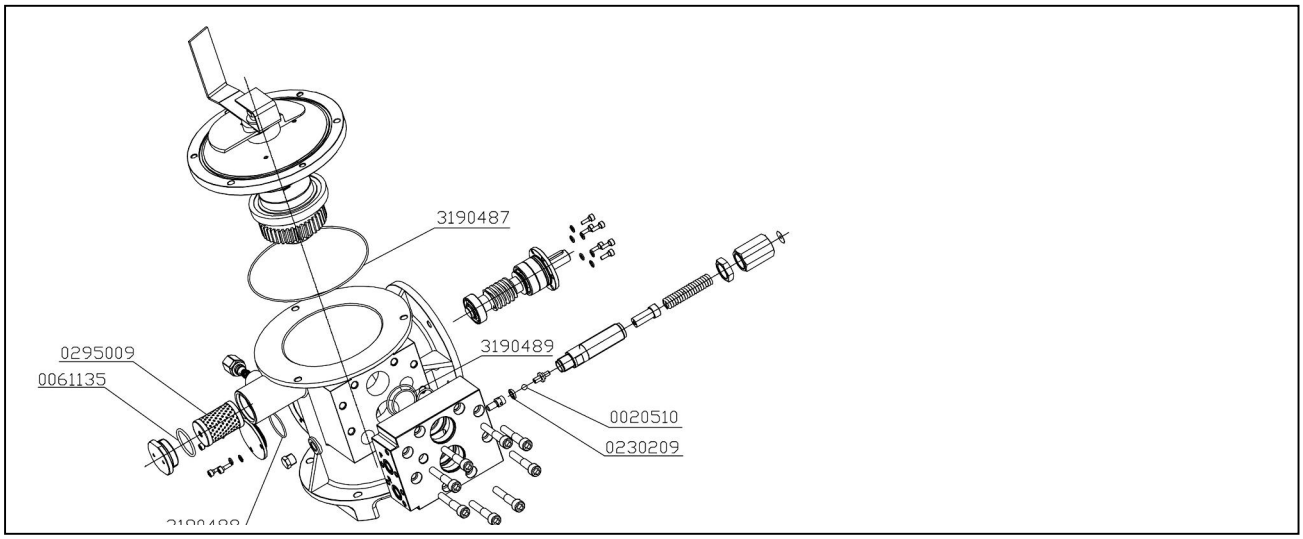
Standard equipment		
Equipment	**Description**	**Code**
Sumo Pump	400 cm3/min grease pump 30 Kg (66lb) tank with inverter code 0083420 at 24 V DC	2477000
	400 cm3/min grease pump 100 Kg (220lb) tank with inverter code 0083420 at 24 V DC	2477001
	400 cm3/min grease pump 80 Kg (176lb) transparent reservoir with inverter code 0083420 at 24 V DC	2477100
	400 cm3/min oil pump 30 Kg (66lb) tank inverter code 0083420 at 24 V DC	2477050
	400 cm3/min oil pump 100 Kg (220lb) tank with inverter code 0083420 at 24 V DC	2477051
	SUMO ATEX Pump in Stainless Steel 316	2477201
Sumo trolley mounted	Sumo Pump 30 Kg sheet metal reservoir with inverter code 0083420 at 24 V DC	1525212
Electromagnetic inverter for base	24V DC 110V AC 50/60Hz 230V AC 50/60HZ	0083420 0083421 0083422
Instrumentation and optional		
Transparent reservoir	Reservoir, including the tank (PN# 0295056) and all accessories required for use(flanges, screws, nuts, seals)	0295210
Dual Line electric Inverter	24V DC 110V AC 50/60Hz 230V AC 50/60HZ	0083400 0083401 0083402
Pneumatic inverter	24V DC 24V AC 50/60Hz 110V AC 50/60Hz 230V AC 50/60HZ	0083450 0083451 0083452 0083453
Ultrasound level	Ultrasound level with continuous reading 4..20 mA	0295140
Laser level	Laser level with 2 digital outlets with 4 thresholds or 4..20 mA	0295130
Heater module	Heater module for low temperatures < ï 5°C (23° F)	0295065
Pumping element modules	Reserve pumping module 200cm^3/min (24 cu. in) Variable pumping module 100-200cm^3/min (12-24 cu. in) Closure cap for fixed delivery pumping element Closure cap for variable delivery pumping element	0295040C 0295060 0295024 0295035
Oil conversion	Min/max oil level float kit 30 Kg (66lb) Min/max oil level float kit 100 Kg (99.79kg) Filling cap with filter	0295150 0295160 3130138
Terminal Box bracket	Bracket for installing a terminal wiring box onto the base pallet	3044455
Electrical control box Bracket	Bracket for installing a control box onto the base pallet	3044456
Metal pallet	Metal Pallet used as the base of the packaging and also for installation of the pump.	0043446

SPARES

Spares description	Part number
Minimum level kit 30 kg (grease)	0295120
Minimum level kit 100 kg (grease)	0295110
Maximum level kit 30-100 kg (grease)	0295170
Minimum and maximum laser level kit 30kg	0295180
Minimum and maximum laser level kit 100kg	0295130
Minimum and maximum ultrasound level kit 30kg	0295140
Minimum and maximum ultrasound level kit 100kg	0295190
Maximum mechanical level kit 30-100 kg (grease)	0295100
Maximum and minimum float level kit 30 kg (oil)	0295150
Maximum and minimum float level kit 100 kg (oil)	0295160
Grease loading filter	0295009
By-pass spare kit	0295196
Manifold kit	0295195
Tank flange gasket	3190487
Manifold gasket (pump body)	0018863
Manifold gasket (pumping)	3190489
295009 Filter gasket	3190487
Filter cover gasket	0061135
Wormskrew assembly cover gasket	3190488
Body-pump reservoir gasket	3190485
Helicoidal gear assembly	0295020
Wormskrew assembly	0295010

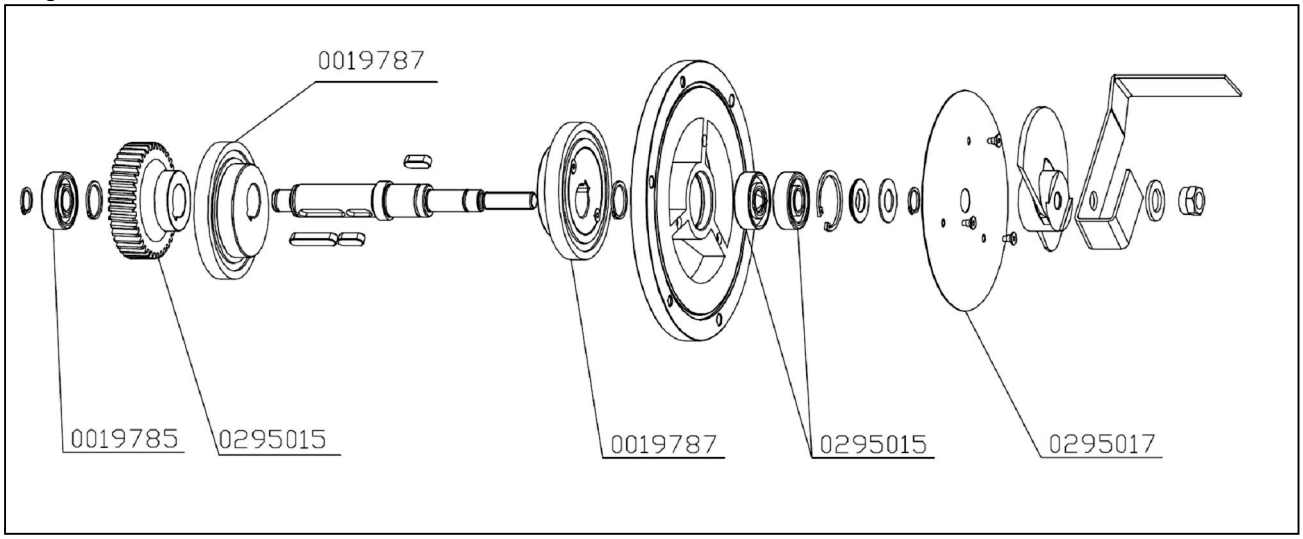
Pump body secondary unit code 0295000

Image 10



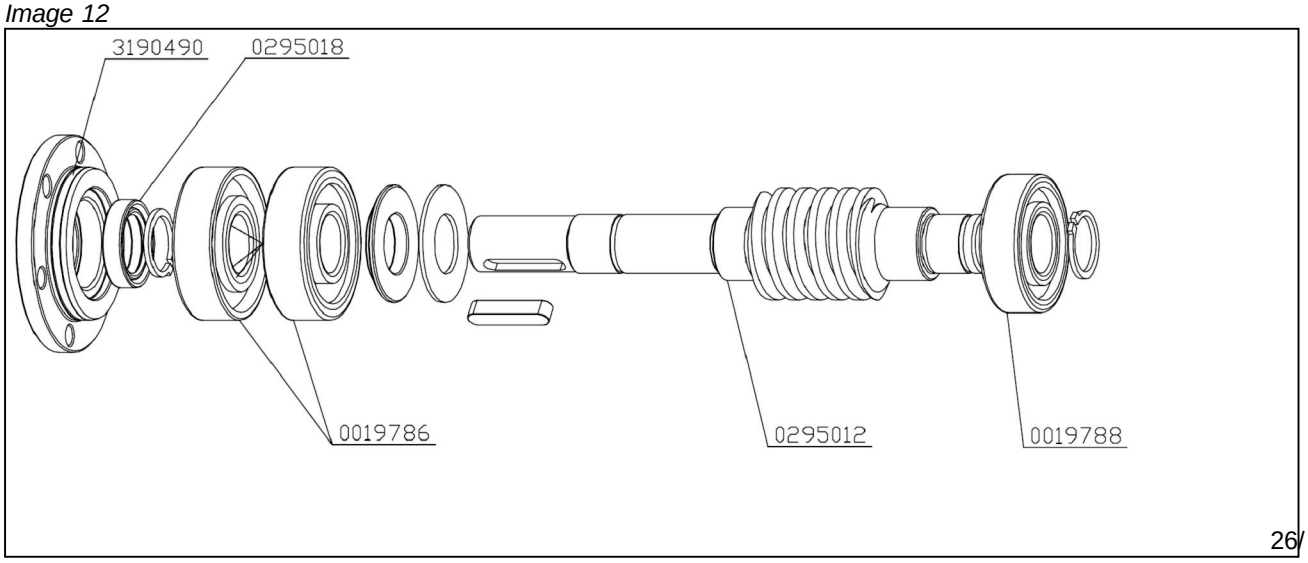
Worm wheel group unit code 0295020

Image 11



Endless screw unit code 0295010

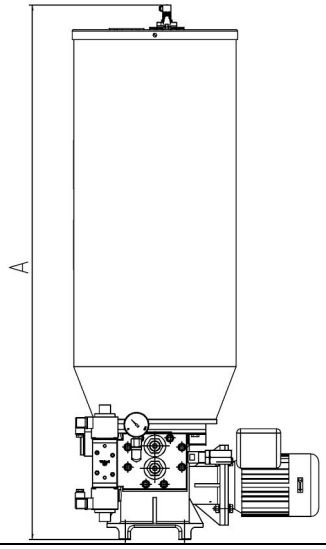
Image 12

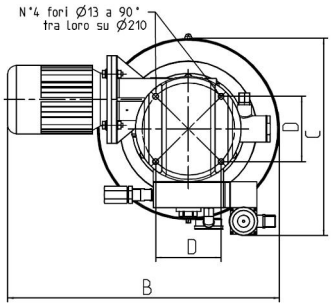


12. DIMENSIONS

To facilitate future maintenance, increase the spaces indicated by at least 200 mm (7.87 in.).

Image 13





	Dimensions mm (inches)
A	900 (35.43), 30 kg tank
	1350 (53.14), 100 kg tank
B	615 (24.21), 30-100 kg tank
C	450 (17.71), 30-100 kg tank
D	148.5 (5.84), 30-100 kg tank

Electric system ï Technical data

Electrical supply:	230-400 Volt ± 5% 50 Hz 240-440 Volt ± 5% 60 Hz
Power absorbed:	0.75 kW

13. HANDLING AND TRANSPORT

A metal pallet is used for transport and storage with packing at the side and a wooden cover.
The pump is fixed on a metal pallet, which allows safe handling using a transpallet or forklift truck. The metal pallet has been designed so that it can be installed in the installation, being equipped with 4 (four) holes of Ø 14 mm suitable for fixing to the floor.
The machine components can withstand temperatures, during storage, from -20 to + 50 °C (-4°F - 122°F)*; it is therefore necessary, in order to avoid damages, for the machine to be started up when the machine has reached a minimum temperature of +5 °C (+41°F).*

14. PRECAUTIONS FOR USE

It is necessary to carefully read the warnings and risks associated with using a lubricant pump. The operator must understand how it works and must clearly understand the dangers by studying the user manual.

15. CONTRAINDICATIONS FOR USE

The check on compliance with the essential safety requirements and with the stipulations indicated in the machine directives are to be carried out by means of compiling the checklists already made available and contained in the *technical file.*
Three types of lists were used:

- list of dangers (section from EN 414 relating to EN 292)
- Application of the essential safety requirements Machine Dir. - app. 1, part 1)
- electrical safety stipulations (EN 60204-1)

See below a list of dangers which have not been completely eliminated, but are considered acceptable:

- During assembly/maintenance it is possible that there may be an oil splash (consequently this operation must be carried out using appropriate individual protective devices);
- contact with oil -> see instructions for using appropriate individual protective devices DPI;
- Use of an inappropriate lubricant -> fluid characteristics indicated both on the pump and in the manual (**if in doubt consult our Technical Office);**
- protection against direct and indirect contact must be provided by the user;
- whenever the cover is opened for an intervention resealing the catch is essential;
- The pumpôs working logic requires it to operate at all times, so it is necessary to pay attention to the electric connection. If there is no current the customerôs machine can only be restarted following a reset while the lubrication pump can restart automatically.

Unacceptable fluids	
Fluids	**Dangers**
Lubricant with abrasive additives	High consumption of contaminated parts
Lubricant with silicon additives	Jamming of the pump
Benzine ï solvents ï inflammable liquids	Fire ï explosion ï damage to gaskets
Corrosive products	Corrosion of the pump ï injuries to persons
Water	Pump oxidation
Food substances	Contamination of these substances

16. GUARANTEE

All Dropsa products are guaranteed for a maximum of 12 months from the delivery date, for constructional and material faults.
The guarantee is extended as indicated below:

Complete installation of the system by Dropsa: 24 months.

Other components: 12 months from the date of installation; if installation takes place 6 months or more following the delivery date, the guarantee will cover a maximum of 18 months from the delivery date.

In the event of equipment malfunction we must be notified of precise details of the fault encountered, supplying the Dropsa code, the test number if present (expressed as: xxxxxx-xxxxxx), delivery and installation date and, finally, conditions of using the product/s in question.

Once this information has been received we will decide at our own discretion whether to provide technical assistance or to provide a return authorisation number (RAN) with precise instructions about returning the equipment.

After receiving the equipment and on the basis of careful analysis Dropsa reserves the right to decide whether to repair or replace the product. If the guarantee is still valid we will proceed to repair or replace the part at our own expense.

If the returned product is not faulty, Dropsa will decide at its own discretion whether or not to charge the customer for the costs incurred (logistics etc.).

This guarantee must be understood to be cancelled if the product shows signs of damage and resulting from incorrect use, negligence, normal wear and tear, chemical corrosion, installation not in compliance with the instructions expressly indicated and use contrary to the manufacturerõs recommendations. Any changes, tampering or alterations to the equipment or its parts made without written authorisation from Dropsa S.p.A., relieves the latter from all liability and releases it from the obligations of the guarantee.

Parts subject to normal wear and tear and perishable parts are not covered by the guarantee.

Anything not expressly indicated must be considered to be excluded from the guarantee as well as damages or costs resulting from faults in the actual product.

The conditions of validity of the Dropsa guarantee are understood to be implicitly accepted as soon as the equipment is purchased. Any changes to or departures from this guarantee must only be considered valid after prior authorisation from Dropsa S.p.A.

DROPSA S.p.A. declines any liability for personal injuries or damages to property in the event of failure to comply with the instructions provided in this manual.
Any changes to the component parts of the system or a change in the intended use of the latter or its parts without written authorisation from DROPSA S.p.A. relieve the latter from any liability for personal injuries and/or damage to property and relieve it of any guarantee obligation.

17. DECLARATION OF CONFORMITY

Manufacturer:

DROPSA SpA
Company
Via B. Croce, 1 ï 20090 Vimodrone (MI)
Address
02-250.791
Telephone

It is certified that:

The machine: Sumo Pump

* has been manufactured in accordance with the DIRECTIVES OF THE EUROPEAN COMMUNITY COUNCIL relating to: machines (98/37/CE), low voltage (BT 73/23/CEE).
* has been manufactured, as applicable in accordance with the following standards and harmonised technical specifications.

EN 292-1/2, EN 1050, EN 982, EN 11200, EN 60947, EN 894-1/2.

Technical Director — W. Divisi

Product Manager — **Name**

DROPSA SpA
Company

02/04/08

Signature — **Date**

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18. DISTRIBUTORS

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